

AMENDMENTS TO THE CLAIMS

Listing of Claims:

1. (Previously Presented) A process for making a porous catalyst, comprising
 - a) providing an aqueous solution containing a nanoparticle precursor;
 - b) forming a composition containing nanoparticles;
 - c) adding a first catalytic precursor and a pore-forming agent to the composition containing nanoparticles and allowing the first catalytic precursor, the pore-forming agent, and the nanoparticles to form a clear solution;
 - d) air drying the clear solution at about room temperature so as to allow an organic-inorganic material gel structure to form; and
 - e) removing the pore-forming agent from the organic-inorganic structure so as to yield a porous catalyst.
2. (Previously Presented) The process according to claim 1 wherein the first catalytic precursor is a metal salt.
3. (Currently Amended) The process according to claim 1 wherein the pore-forming agent is a cationic surfactant, an anionic surfactant, a zwitterionic surfactant, or combinations thereof.
4. (Previously Presented) The process according to claim 1 wherein (b) and (c) are performed concurrently.

5. (Original) The process according to claim 1 wherein the nanoparticles are nanoparticles of a metal or metal oxide.

6. (Canceled)

7. (Previously Presented) The process according to claim 2, wherein the metal salt comprises ammonium metavanadate, ammonium metatungstate, or combinations thereof.

8. (Currently Amended) The process according to claim 1 wherein the organic-inorganic material gel structure formed in (d) is an aerogel or a xerogel.

9. (Currently Amended) The process according to claim 1 wherein the porous catalyst comprises nanoparticles coated with a first catalytic component layer, wherein the first catalytic component layer is amorphous.

10. (Previously Presented) The process according to claim 1 wherein the porous catalyst comprises nanoparticles coated with a first catalytic component layer, wherein the surface density of the first catalytic component layer is greater than 4 molecules per nm².

11. (Previously Presented) The process according to claim 1 wherein the first catalytic component is non-crystalline in the porous catalyst.

12. (Previously Presented) The process according to claim 1 wherein the first catalytic precursor is at least partially polymerized in the porous catalyst.

13. - 18. (Canceled)

19. (Previously Presented) The process according to claim 1, wherein the nanoparticles comprise zirconium oxide nanoparticles, titanium oxide nanoparticles, aluminum oxide nanoparticles, silicon oxide nanoparticles, or combinations thereof.

20. (Previously Presented) The process according to claim 1, wherein the first catalytic precursor comprises vanadium, tungsten, niobium, tantalum, rhenium, molybdenum, or combinations thereof.

21. (Previously Presented) The process according to claim 1, wherein the pore-forming agent comprises an ethylene oxide block copolymer.

22. (Previously Presented) The process according to claim 1, wherein the pore-forming agent comprises a non-ionic poly(ethylene oxide)-poly(propylene oxide)-poly(ethylene oxide) triblock copolymer.

23. (Previously Presented) The process according to claim 22, wherein the pore-forming agent comprises EO₂₀PO₇₀EO₂₀, EO₅PO₇₀EO₅, EO₁₀₆PO₇₀EO₁₀₆, EO₁₇PO₆₀EO₁₇, or combinations thereof.

24. (Previously Presented) The process according to claim 1, wherein the pore-forming agent comprises hexadecyl trimethyl ammonium, cetyl trimethyl ammonium bromide, or combinations thereof.

25. (Previously Presented) The process according to claim 1, wherein the nanoparticles are zirconium oxide nanoparticles, the first catalytic component or precursor thereof comprises tungsten, and the pore-forming agent comprises $EO_{20}PO_{70}EO_{20}$, $EO_5PO_{70}EO_5$, $EO_{106}PO_{70}EO_{106}$, $EO_{17}PO_{60}EO_{17}$, or combinations thereof.

26. (Previously Presented) The process according to claim 1, wherein the nanoparticles are zirconium oxide nanoparticles or aluminum oxide nanoparticles, the first catalytic precursor comprises tungsten or vanadium, and the pore-forming agent comprises $EO_{20}PO_{70}EO_{20}$, $EO_5PO_{70}EO_5$, $EO_{106}PO_{70}EO_{106}$, $EO_{17}PO_{60}EO_{17}$, or combinations thereof.

27. (Previously Presented) The process according to claim 1, wherein (e) comprises calcining the organic-inorganic structure to remove the pore-forming agent.

28. (Previously Presented) The method of claim 1 further comprising impregnating the porous catalyst with a second catalytic precursor, a non-surfactant polymer, or combinations thereof.

29. (New) The process according to claim 1 wherein the gel is formed by hydrolyzing and condensing a metal alkoxide, a metal salt, or combinations thereof, and wherein the addition of the first catalytic precursor and the pore-forming agent to the composition does not result in precipitation.

30. (New) A process comprising:

forming a gel comprising a plurality of nanoparticles, wherein at least some of the nanoparticles have a diameter of two nanometers;

adding a catalyst precursor to the gel;

adding a porogen to the gel;

drying the gel, the catalyst precursor, and the porogen, thereby forming a dried gel; and

removing the porogen from the dried gel, thereby forming a porous catalyst.

31. (New) The process according to claim 30 wherein the porogen is anionic or zwitterionic.

32. (New) The process according to claim 31 wherein the composition is formed without precipitation.

33. (New) A process comprising:

forming a gel comprising a plurality of nanoparticles;
adding a catalyst precursor to the gel;
adding a porogen to the gel, wherein the porogen is anionic;
drying the gel, the catalyst precursor, and the porogen, thereby forming a dried gel; and
removing the porogen from the dried gel, thereby forming a porous catalyst.

34. (New) The process according to claim 33 wherein at least some of the nanoparticles have a diameter of two nanometers.

35. (New) The process according to claim 33 wherein the gel is formed by hydrolyzing and condensing a metal alkoxide, a metal salt, or combinations thereof.